

STM32 Value line



STMicroelectronics

32-bit microcontrollers for greater choice in cost-sensitive applications

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Release your creativity with STMicroelectronics' STM32 microcontrollers.

Convince our panel of judges that your STM32F-based design is taking full advantage of this leading-edge microcontroller family based on the ARM Cortex™-M3 core, and win a Harley Davidson motor bike.

The most original and exciting submission built around an STM32F with any memory size or peripheral equipment will allow you to enter for a new experience.

More information concerning the STM32, on how to get your Discovery Kit and the conditions of the competition can be found on www.ebv.com/stdesigncontest.

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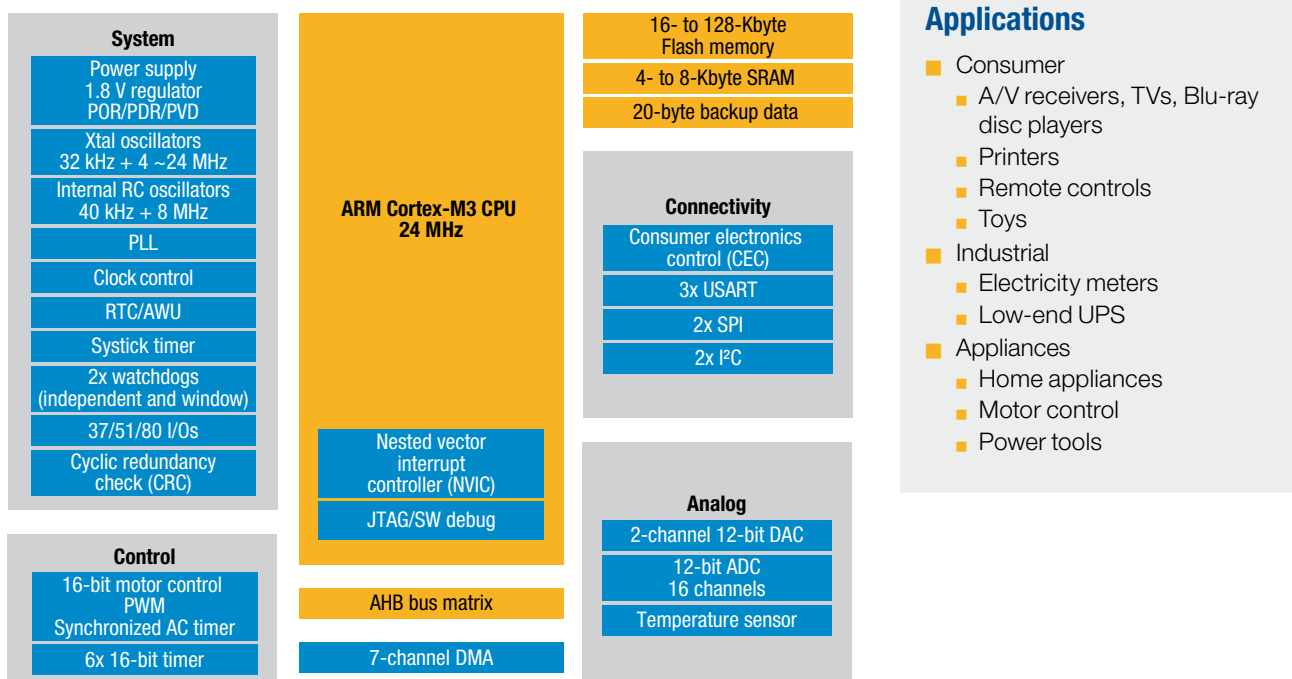
STM32 Value line

The STM32 Value line complements our STM32 Cortex™-M microcontroller product portfolio by offering a low-cost product line that is pin-to-pin compatible with the STM32 portfolio. It brings new features such as new 16-bit timers and CEC function to expand the range of applications addressed in consumer, appliance and industrial segments.

Based on the ARM Cortex-M3 core running at up to 24 MHz, the STM32 Value line offers excellent cost-performance-peripherals trade-off.

It provides all the essential features to make it the perfect choice to develop cost-effective applications traditionally addressed by 16-bit microcontrollers.

STM32 Value line block diagram



Applications

- Consumer
 - A/V receivers, TVs, Blu-ray disc players
 - Printers
 - Remote controls
 - Toys
- Industrial
 - Electricity meters
 - Low-end UPS
- Appliances
 - Home appliances
 - Motor control
 - Power tools

Abbreviations:

AWU:	Auto wake up from halt	PDR:	Power-down reset	RTC:	Real-time clock
BOR:	Brown-out reset	POR:	Power-on reset	SPI:	Serial peripheral interface
PC:	Inter integrated circuit	PVD:	Programmable voltage detector	USART:	Universal sync/async receiver transmitter

Features and benefits

Features	Benefits
Up to seven PWM 16-bit timers including advanced control timer for a total of 26 channels	Perfect fit for control applications
Three independent PWM 16-bit timers with complementary output and deadtime generation	Ideal for appliance control applications including induction cooking
On-chip 12-bit dual channel DAC with DMA support and output buffers	Decreased total system cost
Consumer electronics control (CEC) peripheral	Reduced design complexity and minimized CPU, peripheral and memory use
CEC, 400 kHz I ² C, up to 12 Mbit/s master and slave SPI, up to 3 Mbit/s USART	Extensive connectivity capability
ARM Cortex-M3 Thumb-2 32-bit instruction set and 7-channel DMA	Achieves superior performance with 16-bit code density
CRC (cyclic redundancy check) with DMA support	Eases Flash memory integrity check
Built-in POR, PDR, LVD, watchdog timer, factory trimmed 8 MHz RC oscillator and 40 kHz for RTC and watchdog	System cost reduction

STM32 Value line highlights

Well adjusted features for appliance, consumer and industrial applications

The STM32 Value line delivers high processing performance capability coupled with up to twelve 16-bit timers, including a motor control timer and a fast 1.2 µs conversion time 12-bit ADC for efficient appliance and industrial-control applications.

The 12-bit dual-channel DAC can be used in many audio applications such as security alarms, toys, answering machines, human-machine interfacing and in many other control-engineering, home automation and audio applications.

The built-in H/W CEC (consumer electronic control) interface enables connectivity for controlling HDMI-enabled home entertainment systems, so releasing processor resources.

Fully pin-to-pin and software compatible with the STM32 family

The STM32 Value line, with added functionalities and fully compatible with all the STM32 product lines, expands uses for the STM32.

STM32 product lines

Common core peripherals and architecture:

Communication peripherals: USART, SPI, I ² C
Multiple general-purpose timers
Integrated reset and brown-out warning
Multiple DMA
2x watchdogs Real-time clock
Integrated regulator PLL and clock circuit
External memory interface (EMI)
Dual 12-bit DAC
Main oscillator and 32 kHz oscillator
Low-speed and high-speed internal RC oscillators
-40 to +85 °C and up to 105 °C operating temperature range
Low voltage 2.0 to 3.6 V or 1.65 to 3.6 V (L-1 series) 5.0 V tolerant I/Os
Temperature sensor

F-1 series - Connectivity line STM32F105/STM32F107									
72 MHz Cortex-M3 CPU	Up to 64-Kbyte SRAM	Up to 256-Kbyte Flash	2x 12-bit ADC (1 µs)	USB 2.0 OTG FS	3-phase MC timer	2x CAN 2.0B	2x I ² S audio class	Ethernet IEEE 1588	
F-1 series - Performance line STM32F103									
72 MHz Cortex-M3 CPU	Up to 96-Kbyte SRAM	Up to 1-Mbyte Flash	2/3x 12-bit ADC (1 µs)	USB FS device	3-phase MC timer	CAN 2.0B	2x I ² S	SDIO	
F-1 series - USB Access line STM32F102									
48 MHz Cortex-M3 CPU	Up to 16-Kbyte SRAM	Up to 128-Kbyte Flash	12-bit ADC (1 µs)	USB FS device					
+									
F-1 series - Access line STM32F101									
36 MHz Cortex-M3 CPU	Up to 80-Kbyte SRAM	Up to 1-Mbyte Flash	12-bit ADC (1 µs)						
F-1 series - Value line STM32F100									
24 MHz Cortex-M3 CPU	Up to 8-Kbyte SRAM	Up to 128-Kbyte Flash	12-bit ADC (1.2 µs)	3-phase MC timer	CEC				
L-1 series - STM32L151/2									
32 MHz Cortex-M3 CPU	Up to 16-Kbyte SRAM	Up to 128-Kbyte Flash	12-bit ADC (1 µs)	USB FS device	Data EEPROM 4 Kbytes	LCD 8x40	Comparator	BOR MSI VScal	ULP features

Abbreviations:

BOR: Brown-out reset
 CEC: Consumer electronic control
 MSI: Multi speed internal oscillator
 RNG: Random number generator
 SDIO: Secure digital input output
 ULP: Ultra-low-power
 VScal: Voltage scaling

Device summary



Part number	Flash memory (Kbytes)	RAM (Kbytes)	A/D inputs	Timer functions		Serial interface	I/Os (high current)	Packages	Supply voltage (V)	Special features
				12 or 16-bit (IC/OC/PWM)	Others					
48 pins	STM32F100C4	16	4	10x12-bit	6x16-bit (16/16/21)	1xSPI, 1xI ² C, CEC, 2xUSART (IrDA, ISO 7816)	37(37)	LQFP48	2.0 to 3.6	24 MHz CPU speed, 2-channel DAC, V _{bat} pin, low-power features, embedded POR, PDR and PVD, 8 MHz and 40 kHz internal RC oscillator, 4-24 MHz main oscillator, dedicated 32 kHz oscillator, -40 to 85 °C or -40 to 105 °C
	STM32F100C6	32	4	10x12-bit	6x16-bit (16/16/21)		37(37)	LQFP48		
	STM32F100C8	64	8	10x12-bit	7x16-bit (18/18/21)		37(37)	LQFP48		
	STM32F100CB	128	8	10x12-bit	7x16-bit (18/18/21)		37(37)	LQFP48		
64 pins	STM32F100R4	16	4	16x12-bit	6x16-bit (16/16/21)	2xWWDG, RTC, 24-bit down counter, 2x16-bit basic timers	51(51)	LQFP64, TFPGA64		
	STM32F100R6	32	4	16x12-bit	6x16-bit (16/16/21)		51(51)	LQFP64, TFPGA64		
	STM32F100R8	64	8	16x12-bit	7x16-bit (20/20/23)		51(51)	LQFP64, TFPGA64		
	STM32F100RB	128	8	16x12-bit	7x16-bit (20/20/23)		51(51)	LQFP64, TFPGA64		
100 pins	STM32F100V8	64	8	16x12-bit	7x16-bit (20/20/26)	2xSPI, 2xI ² C, CEC, 3xUSART (IrDA, ISO 7816)	80(80)	LQFP100		
	STM32F100VB	128	8	16x12-bit	7x16-bit (20/20/26)		80(80)	LQFP100		

STM32 Value line: development tools

A complete set of hardware and software is available to help designers evaluate the STM32 Value line features and to allow fast application development.

Development tools, operating systems, solution stacks and more

Choose from a full range of development solutions from lead suppliers that deliver start-to-finish control of application development from a single integrated development environment. Access a variety of royalty-free, small-footprint operating systems and a wealth of off-the-shelf stacks from numerous third-party suppliers.

For detailed information, see www.st.com/stm32tools

STM32 Value line Discovery

The cheapest and quickest way to discover the STM32 Value line family. Embedded ST-LINK included to debug applications.

Order code:
STM32VLDISCOVERY



STM32100B-EVAL evaluation board

Complete hardware evaluation platform with the STM32100B-EVAL, implementing the full range of device peripherals and features.



STM32 embedded firmware

STM32 firmware library: complete packages consisting of device drivers for all the standard device peripherals. Each device driver includes a set of functions covering full peripheral functionality.

STM32 Class B norm certification self-test routines: a full set of ready-to-use self-test routines for home-appliance certification under EN/IEC 60335-1 Class B norm (functional safety).

STM32 motor control software: complete 3-phase motor control library supporting PMSM motors in sensor and sensorless mode and AC induction motors in sensor mode, and a patented single-shunt algorithm.

STM32 CEC software: this complete software supported by the STM32100B-EVAL evaluation board provides an implementation of CEC high-level protocol and full demonstration software.



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EBV European Headquarters

EBV Elektronik GmbH & Co. KG | D-85586 Poing | Im Technologiepark 2-8 | Tel. +49 (0)8121 774-0 | www.ebv.com

EBV REGIONAL OFFICES

AUSTRIA

A-1120 Wien
Schönbrunner Str. 297 - 307
Tel. +43 (0)18 91 52-0
Fax +43 (0)18 91 52-30

BELGIUM

B-1831 Diegem
Kouterveldstraat 20
Tel. +32 (0)27 16 00 10
Fax +32 (0)27 20 81 52

CZECH REPUBLIC

CZ-170 00 Praha 7
Argentinská 38/286
Tel. +420-234 091 011
Fax +420-234 091 010

DENMARK

DK-8230 Åbyhøj
Ved Lunden 9
Tel. +45 86 25 04 66
Fax +45 86 25 06 60

DK-2730 Herlev

Ellekær 9, 2 tv
Tel. +45 39 69 05 11
Fax +45 39 69 05 04

ESTONIA

EE-13157 Tallinn
Ehitajate tee 114
Tel. +372 625 79 90
Fax +372 625 79 95
Cell. +372 513 22 32

FINLAND

FIN-02240 Espoo
Pihatörmä 1 a
Tel. +358 (0)927 05 27 90
Fax +358 (0)9 27 09 54 98

FIN-90100 Oulu

Nahkatehtaankatu 2
Tel. +358 (0)85 62 49 10
Fax +358 (0)85 62 49 15

FRANCE

F-13854 Aix-en-Provence
115, Rue Nicolas Ledoux
Immeuble Hemiris, Bâtiment A,
Tel. +33 (0)442 39 65 40
Fax +33 (0)442 39 65 50

F-92184 Antony Cedex (Paris)

3, rue de la Renaissance
Tél. +33 (0)140 96 30 00
Fax +33 (0)140 96 30 30

F-35510 Cesson Sévigné (Rennes)

29, av. des Peupliers
Tél. +33 (0)299 83 00 50
Fax +33 (0)299 83 00 60

F-67400 Illkirch Graffenstaden

Rue Gruninger
Parc d'innovation d ,Illkirch
Tél +33 (0)3 90 40 59 69
Fax +33 (0)3 88 65 11 25

F-31670 Labège (Toulouse)

Immeuble Les Berges du Lac
Bat A, 45 Rue du Colombier
Tél. +33 (0)561 00 84 61
Fax +33 (0)561 00 84 74

F-69693 Venissieux (Lyon)

Parc Club du Moulin à Vent
33, Av. du Dr. Georges Lévy
Tél. +33 (0)472 78 02 78
Fax +33 (0)478 00 80 81

GERMANY

D-12277 Berlin-Mariendorf
Kitzingstr. 15 - 19
Tel. +49 (0)30 74 70 05-0
Fax +49 (0)30 74 70 05-55

D-30938 Burgwedel

In der Meineworth 21
Tel. +49 (0)5139 80 87-0
Fax +49 (0)5139 80 87-70

D-41564 Kaarst

An der Gumpgesbrücke 7
Tel. +49 (0)2131 96 77-0
Fax +49 (0)2131 96 77-30

D-71229 Leonberg

Neue Ramtelstraße 4
Tel. +49 (0)7152 30 09-0
Fax +49 (0)7152 759 58

D-90471 Nürnberg

Lina-Ammon-Str. 19B
Tel. +49 (0)911 817 669-0
Fax +49 (0)911 817 669-20

D-85586 Poing

Im Technologiepark 2-8
Tel. +49 (0)8121 774-0
Fax +49 (0)8121 774-422

D-04435 Schkeuditz

Airport Business Center Leipzig
Frankfurter Straße 2
Tel. +49 (0)34204 4511-0
Fax +49 (0)34204 4511-99

D-78050 VS-Villingen

Kaiserring 12
Tel. +49 (0)7721 998 57-0
Fax +49 (0)7721 998 57-70

D-65205 Wiesbaden

Borsigstraße 36
Tel. +49 (0)6122 80 88-0
Fax +49 (0)6122 80 88-99

HUNGARY

H-1117 Budapest
Budafoki út 91-93, West Irodaház
Tel. +36 1 436 72 29
Fax +36 1 436 72 20

IRELAND

IRL-Dublin 12
Calmount Business Park
Unit 7, Block C
Tel. +353 (0)14 09 78 02
Fax +353 (0)14 56 85 44

ISRAEL

IL-40600 Tel Mond
Drorrim South Commercial Center
P.O. Box 149
Tel. +972 (0)9 778 02 60
Fax +972 (0)9 796 68 80

ITALY

I-20092 Cinisello Balsamo (MI)
Via C. Frova, 34
Tel. +39 02 66 09 62 90
Fax +39 02 66 01 70 20

I-50127 Firenze

Via Panciatichi, 40
Palazzo 11
Tel. +39 05 54 36 93 07
Fax +39 05 54 26 52 40

I-41100 Modena (MO)

Via Carlo Cattaneo, 54
Tel. +39 059 29 24 211
Fax +39 059 29 29 486

I-80128 Napoli (NA)

Via G. Capaldo, 10
Tel. +39 081 193 016 03
Fax +39 081 198 061 24
Cell. +39 335 8 39 05 31

I-00155 Roma

Viale Palmiro Togliatti 1639
Tel. +39 064 06 36 65/789
Fax +39 064 06 37 77

I-35030 Sarreola di Rubano (PD)

Piazza Adelaide Lonigo, 8/11
Tel. +39 049 89 74 701
Fax +39 049 89 74 726

I-10156 Torino

Corso Vercelli, 348
Tel. +39 011 262 56 90
Fax +39 011 262 56 91

NETHERLANDS

NL-3606 AK Maarssenbroek
Planetenbaan 116
Tel. +31 (0)346 58 30 10
Fax +31 (0)346 58 30 25

NORWAY

Postboks 101, Manglerud
Ryensvingen 3B
N-0681 Oslo
Tel. +47 22 67 17 80
Fax +47 22 67 17 89

POLAND

PL02-672 Warszawa
ul. Woloska 18
Tel. +48 (0)22 640 23 55
Fax +48 (0)22 640 23 56

PL-50-062 Wrocław

Pl. Solny 16
Tel. +48 (0)71 34-2 29-44
Fax +48 (0)71 34-2 29-10

ROMANIA

Construdava Business Center
Sos. Pipera-Tunari 4c
Voluntari, Ilfov (Bucharest)
RO - 077190 Romania
Tel. +40 21 529 6911
Fax +40 21 529 6901

RUSSIA

RUS-127486 Moscow
Korovinskoye Shosse 10,
Build 2, Off.28
Tel. +7 495 937 87 07
Fax +7 495 937 87 06

RUS-195197 St. Petersburg

Polustrovsky Prospect 43,
Office 421
Tel. +7 812 635 70 63
Fax +7 812 635 70 64

SLOVAK REPUBLIC

SK-85101 Bratislava
Digital Park, Einsteinova 21
Tel. +421 2 321 111 41
Fax +421 2 321 111 40

SLOVENIA

SI-1000 Ljubljana
Dunajska c. 159
Tel. +386 (0)1 56 09 778
Fax +386 (0)1 56 09 877

SOUTH AFRICA

ZA-8001 Foreshore, Cape Town
1 Mediterranean Street
5th Floor MSC House
Tel. +27 (0)21 402 19 40
Fax +27 (0)21 419 62 56

ZA-3629 Westville

Forest Square, 11 Derby Place
Suite 4, Bauhinia Building
Tel. +27 (0)31 205 12 05
Fax +27 (0)31 205 22 65

ZA-2157 Woodmead,

Johannesburg
Woodlands Office Park
141 Western Service Road
Building 14-2nd Floor
Tel. +27 (0)11 236 19 00
Fax +27 (0)11 236 19 13

SPAIN

E-08950 Esplugues de Llobregat
(Barcelona)
Antón Fortuny 14-16 Esc.C 3º 2a
Tel. +34 93 473 32 00
Fax +34 93 473 63 89

E-39010 Santander (Cantabria)

Calle San Fernando
nº 44 Entresuelo
Tel. +34 94 223 67 55
Tel. +34 94 237 45 81

E-28760 Tres Cantos (Madrid)

Centro Empresarial Euronova
C/Ronda de Poniente, 4
Tel. +34 91 804 32 56
Fax +34 91 804 41 03

SWEDEN

S-21 235 Malmö
Derbyvägen 20
Tel. +46 (0)40 59 21 00
Fax +46 (0)40 59 21 01

S-191 62 Sollentuna

Glimmervägen 14, 7 tr
Tel. +46 (0)859 47 02 30
Fax +46 (0)859 47 02 31

SWITZERLAND

CH-8953 Dietikon
Bernstrasse 394
Tel. +41 (0)44 745 61 61
Fax +41 (0)44 745 61 00

CH-1010 Lausanne

Av. des Boveresses 52
Tel. +41 (0)216 54 01 01
Fax +41 (0)216 54 01 00

TURKEY

TR-34742 Istanbul
Perdemsac Plaza
Bayar Cad. Gülbahar
Sok. No: 17, D: 134 Kozyatagi
Tel. +90 (0)21 64 63 13 52
Fax +90 (0)21 64 63 13 55

UKRAINE

UA-03040 Kiev
Vasilovskaya str. 14
off. 422-423
Tel. +380 44 496 22 26
Fax +380 44 496 22 27

UNITED ARAB EMIRATES

Post Box No: 18657
Warehouse No: FZS1AL06
JAFZA South Zone, Jebel Ali
Dubai, United Arab Emirates
Tel. +971 (4) 886 09 50
Fax +971 (4) 886 09 52

UNITED KINGDOM

South East
Thames House
17 Marlrow Road
Maidenhead
Berkshire, SL6 7AA
Tel. +44 (0)16 28 77 07 07
Fax +44 (0)16 28 78 38 11

South West & Wales

12 Interface Business Park
Bincknoll Lane
Wootton Bassett
Wiltshire, SN4 8SY
Tel. +44 (0)17 93 84 99 33
Fax +44 (0)17 93 85 95 55

North

Manchester International
Office Centre, Suite 3E (MIOC)
Styal Road
Manchester, M22 5WB
Tel. +44 (0)16 14 99 34 34
Fax +44 (0)16 14 99 34 74

Scotland

144 West George Street
Glasgow, G2 2HG
Tel. +44 (0)14 13 52 20 50
Fax +44 (0)14 13 52 20 59

